

115,413

PATENT



SPECIFICATION

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*Complete Accepted, June 20, 1918.*

COMPLETE SPECIFICATION.

Improvement in or relating to Block- and Bar-shears.

I, BRUNO QUAST, of No. 9, Reisch Platz, Cologne-Deutz, Germany, Over-Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 My invention relates to improvements in and relating to block- and bar-shears, the cutter shears of which are freely guided to move in a straight line towards and from each other in a shear support; motion being imparted to them by means of a crank-motion and levers.

10 The generally used mode of operating the shears consists in hydraulic pressure. But recently shears have become known to which motion has been imparted by cranks. The crank-motion of such shears used to be contained within a cutter-head and such cutter-head, with the driving gear, receives an up-and-down motion for every cutting-operation. Now, in modern block-rolling-mills, where pressures of 1000 tons and more are applied to the shears,  
15 and where the shearing operations quickly follow each other to perform the work, it is evident that heavy shocks are occasioned in suddenly starting the huge mass of the crank-motion combined with the other parts carried by the cutter-head. The said cutter-head and all parts belonging to it, accordingly, must be very heavy and strong.

20 Attempts have been made to reduce said shocks by the use of counter-weights destined to balance the working parts. But the pressure in the bearings and the friction of the working parts thereby could not be overcome, on the contrary, they were increased. Each cutting operation, in the main, being followed by a return-motion of the working parts to their starting point, the inertia of the  
25 working parts had to be overcome with every new cutting operation, i.e. fresh motion had to be imparted to the parts in repose to put them in the working state and accelerate the motion.

My invention consists in applying efficient means for reducing, as much as practically possible, the heavy weights of the working parts whilst retaining  
30 crank-motion as a driving power. For such purpose, the crank-motion, first, has been provided with bearings independent of the bearings of the cutter-head, and, further, the pressure is transmitted by means of two levers and draught-bars. In conformity with the mode of operation, which consists in first lowering the upper cutting shear, and then making the lower cutting shear traverse the block from bottom to top, the upper lever has been so arranged that it works  
35 partly as a single-armed and partly as a double-armed lever.

To make my invention perfectly understood, I have illustrated the same in the accompanying drawings, in which two modifications of my said invention are diagrammatically shown.

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Referring, first, to Fig. 1: *a* is a crank-shaft, which, by means of links *g*, actuates a double-armed lever *b*, to which the upper cutter-head *c* is attached as shown at *d*. During the downward motion of said upper cutter-head *c*, the said double-armed lever will only act as a single-armed lever, the fulcrum of which is at *e*. As soon as the upper cutter-head *c* has reached the point of resistance to the stroke, the lever *b* will oscillate upon the supporting point *d*, the latter offering greater resistance than the fulcrum *e*. In consequence, the lever *b* will now act as a double-armed lever, which raises the draught bars *f*, to which the single-armed lever *h* is connected. Said lever *h* turns upon a fulcrum *i* provided within the frame of the shearing machine. To said lever *h* the lower cutter-head *m* is connected by bars *l* arranged to turn upon the fulcrum *k*. During the upward movement of the lower cutter, the block is being severed, after which the return-motion of the two cutter-heads is brought about, the lower cutter-head *m* being lowered first and the upper cutter head *c* beginning to rise to its starting point as soon as the lower cutter-head has reached its lowest position.

With reference to Fig. 2, the modification thereby disclosed works essentially in the same manner, only the said lever *b* works as a double-armed lever during the downward motion of the upper cutter-head *c* and as a single-armed lever during the upward motion of the lower cutter-head *m*. The difference between this construction and the former one exists essentially in that, according to the first modification, shown in Fig. 1, the draught-bars *f* and the crank-shaft *a* are located at opposite sides of the two cutter-heads, while, according to the other modification, shown in Fig. 2, the two cutter-heads *c*, *m*, and draught-bars *f* are located at the same side of the crank-shaft *a*.

To take up and resist the counter-forces arising in the crank-shaft *a* and in the supporting-point *i*, draught-bars *o* have been arranged, according to Fig. 1, between the said crank-shaft and supporting-point *i*, said draught-bars serving to absorb all force except that employed to sever the block and absorbed by said block. The frame *p* of the shearing machine which guides the cutter-heads *c* and *m*, and supports the bearings of the driving shaft, will thus be relieved from other strains ordinary working strains and some lateral pressure occurring in the severing operation of the block.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A block- and bar-shearing machine, the shearing cutters of which freely reciprocate in a straight line within a frame actuated by a crank supported in bearings independent of the two cutter-heads, characterized by the fact, that motion is imparted to the upper shearing cutter-head by means of a lever *b* and to the lower cutter-head by means of another lever *h* linked to the first named lever by draught-bars *f* in such a manner, that the said first-named lever *b*, operates firstly as a single-armed lever, and then as a double-armed lever, substantially as and for the purpose described.

2. A block- and bar-shearing machine of the kind claimed in Claim 1, characterized by the fact, that the strains caused in the shearing operation are absorbed by draught-bars *o* connecting the crank-shaft with the supporting-point *i* of the lever *h* controlling the lower cutter-head, substantially as and for the purpose described.

Dated this 16th day of November, 1917.

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BRITISH

115413 (Brit.)

June 20, 1918

115,413. QUAST'S COMPLETE SPECIFICATION.

(1 SHEET)

LISTED

Quast

Fig. 1

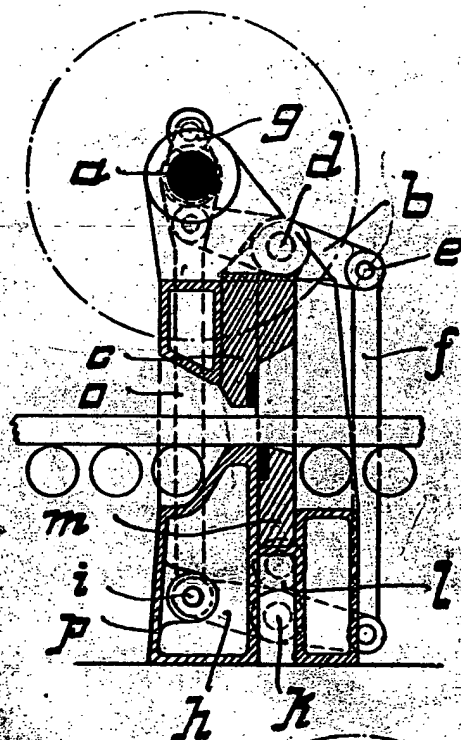
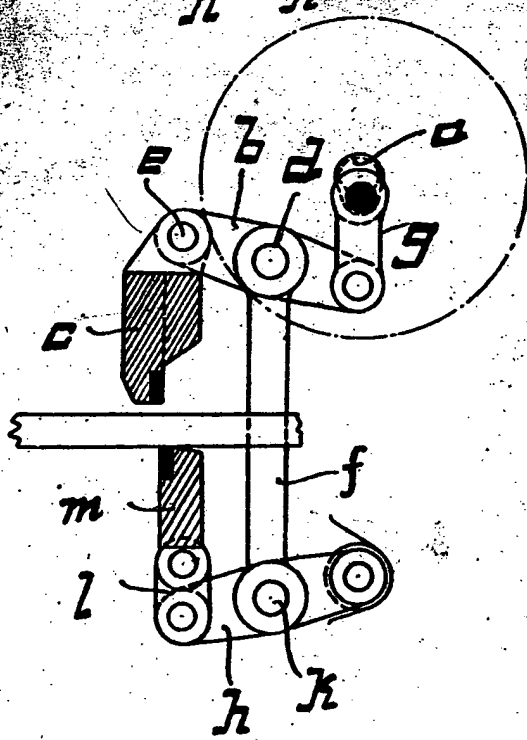


Fig. 2



632  
X679